

U.S. PTO Customer No. 25280

Case # 5392

REMARKS35 USC Section 112, 1<sup>st</sup> Paragraph Rejections:

Claims 16-23 were rejected under 35 USC Section 112, 1<sup>st</sup> paragraph, as failing to comply with the enablement requirement. The Examiner submits that these claims contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Applicants have amended claims 16 - 20 to include the limitation that the inorganic antimicrobial agent is a metal-containing inorganic antimicrobial agent. This amendment is supported, for example, on pages 7 and 8 of the specification. Applicants have further amended claims 16-20 to include the limitation that the sol gel film is adhered to the hard surface substrate at a temperature of between 100°C and 800°C. This further amendment is supported, for example, on page 6 of the specification. Since claims 21 - 23 depend from currently amended claims 18-20, Applicants respectfully submit that this rejection has now been overcome.

35 USC Section 102 (b) Rejections:

Claims 16-23 were rejected under 35 USC 102(b) as being anticipated by Matsuno et al. (US Pat. No. 5,234,717). The Examiner submits that Example 1 of Matsuno et al. discloses a sol gel silicate on glass which meets the instant claims to hard surface substrates coated with a sol gel. The Examiner further contends that inorganic antimicrobial agents as part of the

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coatings of surfaces are clearly evident in Matsuno et al. at col. 3, lines 35-45 for inorganic agents not otherwise specified in the instant claims, glass, the substrate, as preferred at col. 4, lines 47-55 and see Example 1 of SiO<sub>2</sub>.

Applicants respectfully contend that col. 3, lines 35-45 of Matsuno et al. discloses metal-organic compounds usable in the Matsuno et al. invention. Clearly, this differs from Applicants' own invention which discloses and currently claims the use of metal-containing inorganic compounds. Applicants have amended claims 16-20 to include the limitation that (a) the inorganic antimicrobial agent is a metal-containing inorganic antimicrobial agent and (b) that the sol gel film is adhered to the hard surface substrate at a temperature of between 100°C and 800°C.

As such, Applicants respectfully submit that Matsuno et al. specifically do not disclose "[A] hard surface substrate to which a sol-gel film has been applied over at least a portion of the surface thereof at a temperature of between 100°C and 800°C wherein said sol-gel film contains at least one metal-containing inorganic antimicrobial agent..." as recited by Applicants in claims 16-20. Claims 21-23 depend from currently amended claims 18-20. Accordingly, Applicants respectfully submit that claims 16-23, as currently amended, are not anticipated by Matsuno et al.

Claims 1-23 were rejected under 35 USC 102(b) as being anticipated by Oku et al. (US Pat. No. 5,882,808). The Examiner submits Oku et al. disclose silver ion exchange compounds and other metals incorporated in hard surface coatings which are able to impart resistance to heat and provide bacteriicidal effects to the substrates (col. 4, line 46-65 and Example 13). Although *Klebsiella pneumoniae* was not tested by Oku et al., the Examiner contends that "a

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number of other bacteria were tested (col. 7) and one would find, since the compositions are the instant, the test results would be, too."

Applicants respectfully submit that Oku et al. do not disclose each and every limitation or element of Applicants' invention, as currently claimed. Applicants have amended all of the independent claims to include the limitation that the sol-gel film is capable of adherence to a hard surface substrate at a temperature of between 100°C and 800°C (currently amended claims 1, 6-10, and 16-20) and at a temperature of between 300°C and 800°C (currently amended claims 11-15). In contrast to Applicants' invention, Oku et al. teach high temperature curing, such as at 1200°C, for adherence of the ceramic glaze to a ceramic substrate (see Examples 1-14). Thus, since Oku et al. do not contain each and every limitation or element of Applicants' invention as currently claimed, Applicants respectfully submit that claims 1-23 are not anticipated by Oku et al.

35 USC Section 102 (e) Rejections:

Claims 1-23 were rejected under 35 USC 102(e) as being anticipated by Sherman (US Patent Application Publication 2002/0005145). The Examiner submits that Sherman discloses a sol-gel film, which incorporates metal oxides, applied to hard surfaces and exhibiting antibacterial efficacy. The Examiner contends that if the test results claimed by Applicants were carried out by Sherman, the same results – lack of heat/melt distortion and kill rate – would be found.

Sherman discloses dispersing nanoparticulate titanium dioxide in a polar sol-forming medium to make a sol suitable as a coating which may provide anti-microbial effects (see Abstract). However, these anti-microbial effects of Sherman fail to exist in the absence of

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ultraviolet light. The nanoparticulate titanium dioxide coating is photocatalytic, i.e. dependent upon light. Figures 5 and 6 of Sherman illustrate the algae-inhibiting effect of photoactive nanoparticulate titanium dioxide and the inhibiting effect of photoactive nanoparticulate titanium dioxide on *E. coli*, respectively, when the mixtures were exposed **under cool white fluorescent light**. Thus, Applicants respectfully submit that if the same antimicrobial efficacy tests carried out by the Applicants were carried out by Sherman, but were carried out in the absence of ultraviolet light, the same results — lack of heat/melt distortion and kill rates — would not be found. The antimicrobial efficacy of Sherman's coating would be non-existent. Moreover, unlike Sherman's coating, exposure of Applicants' sol gel film to *K. pneumoniae* using the modified plate contact method (as described in the specification on page 15) is not dependent upon exposure to ultraviolet light. Thus, Applicants respectfully submit that the current invention is novel over the Sherman reference and that claims 1-23 are not anticipated by Sherman.

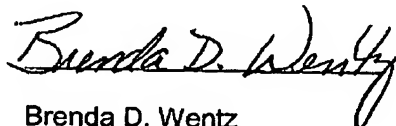
In view of the above amendments and remarks, reconsideration of pending claims 1-23 is earnestly solicited.

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Respectfully requested,

**OFFICIAL**

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